

**License Application  
and  
Monitored Geologic Repository  
Product Guidance Documents  
for  
FY01 and Multiyear Planning**



**April 1, 2000  
Revision 01**

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# **Department of Energy**

## **Monitored Geologic Repository Product Guidance Document Supporting Multiyear Planning**

**April 1, 2000  
Revision 01**

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## LIST OF ACRONYMS

|        |  |
|--------|--|
| ACNW   | Advisory Committee on Nuclear Waste                      |
| ACGIH  | American Conference of Government Industrial Hygienist   |
| ADP    | automated data processing                                |
| AECL   | Atomic Energy of Canada Limited                          |
| AIRFA  | American Indian Religious Freedom Act of 1978            |
| ALARA  | as low as reasonably achievable                          |
| AM     | Assistant Manager  |
| AM/OD  | Assistant Manager/Office Director                        |
| AMR    | Analysis and Modeling Report                             |
| AP     | administrative procedure                                 |
| AR     | administrative record                                    |
| ASCII  | American Standard Code for Information Interchange       |
| ATDT   | automated technical data tracking                        |
| AUG    | affected units of government                             |
|        |  |
| BCP    | Baseline Change Proposal                                 |
| BLM    | Bureau of Land Management                                |
| BMOP   | Business Management Oversight Program                    |
| BN     | Bechtel Nevada   |
| BNI    | Bechtel National, Inc.                                   |
| BOP    | Balance of Plant   |
| BWIP   | Basalt Waste Isolation Project                           |
| BWR    | boiling water reactor                                    |
|        |  |
| CA     | construction authorization                               |
| CAB    | Corrective Action Board                                  |
| CAR    | corrective action request                                |
| CASS   | cost and schedule status                                 |
| CBT    | computer-based training                                  |
| CCB    | Change Control Board                                     |
| CCTV   | closed-circuit television                                |
| CD     | compact disc   |
| CEQ    | Council on Environmental Quality                         |
| CFR    | Code of Federal Regulations                              |
| CIAC   | computer incident advisory capability                    |
| CIO    | Chief Information Officer                                |
| CIRS   | Condition Identification and Reporting/Resolution System |
| CM     | configuration management                                 |
| CMM    | Capability Maturity Model                                |
| CMO    | Construction Management Office                           |
| COO    | conduct of operations                                    |
| COR    | Contracting Officer's Representative                     |
| COR/TM | Contracting Officer's Representative/Technical Monitor   |
| COTS   | commercial off-the-shelf                                 |
| CPR    | Cost Performance Report                                  |
| CQ     | conventional quality                                     |
| CR     | change request   |

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|        |  |
|--------|--|
| CRD    | Comment Response Document                          |
| CRWMS  | Civilian Radioactive Waste Management System       |
| CWBS   | Contractor Work Breakdown Structure                |
| DBE    | design basis event                                 |
| DCC    | Document Control Center                            |
| DEAR   | Department of Energy Acquisition Regulation        |
| DIE    | Determination of Importance Evaluation             |
| DIRS   | document input reference sheet                     |
| DOE/NV | Department of Energy/Nevada Operations Office      |
| DOE    | Department of Energy                               |
| DOI    | Department of the Interior                         |
| DOT    | Department of Transportation                       |
| DPC    | documentation of program change                    |
| DR     | deficiency report                                  |
| DRI    | Desert Research Institute                          |
| DST    | drift-scale test                                   |
| DTN    | data tracking number                               |
| EA     | Environmental Assessment                           |
| EBS    | engineered barrier system                          |
| ECRB   | Enhanced Characterization of the Repository Block  |
| EDA    | Enhanced Design Alternative                        |
| Eh     | oxidation/reduction potential                      |
| EH     | Environment, Safety, and Health Program Office     |
| EIS    | Environmental Impact Statement                     |
| EO     | Executive Order                                    |
| EPA    | Environmental Protection Agency                    |
| EPCRA  | Emergency Planning and Community Right-to-Know Act |
| ES&H   | environmental, safety, and health                  |
| ESF    | Exploratory Studies Facility                       |
| FEHM   | finite element heat and mass                       |
| FEP    | features, events, and processes                    |
| FFTF   | Fast Flex Test Facility                            |
| FHWA   | Federal Highway Administration                     |
| FIMS   | Facility Information Management System             |
| FIS    | Financial Information System                       |
| FLPMA  | Federal Land Policy and Management Act of 1976     |
| FOIA   | Freedom of Information Act                         |
| FR     | Federal Register                                   |
| FTP    | file transfer protocol                             |
| FWS    | Fish and Wildlife Service                          |
| FY     | fiscal year  |
| GAO    | Government Accounting Office                       |
| GC     | General Counsel                                    |
| GIF    | graphic interchange format                         |
| GIS    | Geographic Information System                      |
| GPO    | Government Printing Office                         |
| GPS    | global positioning satellite                       |

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|      |  |
|------|--|
| GTCC | Greater than Class C                       |
| GSA  | General Services Administration            |
| HCA  | Head of Contracting Activity               |
| HEU  | high enriched uranium                      |
| HLW  | high-level waste                           |
| HP   | hydrological procedure                     |
| HRC  | Harry Reid Center                          |
| HRCQ | highway route controlled quantity          |
| HRF  | Hydrological Research Facility             |
| HTML | hypertext markup language                  |
| HVAC | heating, ventilation, and air conditioning |
| IA   | Information Architecture                   |
| IAB  | Information Architecture Baseline          |
| IAF  | Information Architecture Framework         |
| ICD  | Interface Control Document                 |
| ICE  | independent cost evaluation                |
| ICN  | Interim Change Notice                      |
| IDP  | individual development plan                |
| IG   | Inspector General                          |
| III  | Integrated Information Infrastructure      |
| IM   | information management                     |
| IPS  | integrated project schedule                |
| IRSR | Issue Resolution Status Report             |
| ISA  | integrated safety analysis                 |
| ISM  | integrated safety management               |
| ISMS | Integrated Safety Management System        |
| ISO  | International Standards Organization       |
| ISP  | Information Security Program               |
| ISRI | Information Science Research Institute     |
| IT   | information technology                     |
|      |  |
| KTI  | key technical issue                        |
|      |  |
| LA   | License Application                        |
| LADS | License Application Design Selection       |
| LAMP | License Application Management Plan        |
| LAN  | local area network                         |
| LANL | Los Alamos National Laboratory             |
| LCAM | life cycle asset management                |
| LCC  | life cycle cost                            |
| LOE  | level of effort                            |
| LLNL | Lawrence Livermore National Laboratory     |
| LRE  | latest revised estimate                    |
| LRP  | long-range plan                            |
| LSN  | Licensing Support Network                  |
|      |  |
| M&A  | management and administration              |
| MAN  | metropolitan area network                  |
| MC&A | Material Control and Accountability        |

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|        |  |
|--------|--|
| MGR    | Monitored Geologic Repository  |
| MGR-RD | Monitored Geologic Repository Requirements Document                                |
| M&O    | Management and Operating Contractor  |
| MPR    | Manager's Project Review   |
| MSDS   | Material Safety Data Sheets  |
| MTHM   | metric tons of heavy metal   |
| MTS    | Management and Technical Support Contractor  |
|        |  |
| NAC    | Nevada Administrative Code   |
| NAGPRA | Native American Graves Protection and Repatriation Act                             |
| NARA   | National Archives and Records Administration                                       |
| NAS    | National Academy of Sciences   |
| NCE    | Network Computing Environment  |
| NCEWDP | Nye County Early Warning Drilling Program  |
| NDE    | nondestructive evaluation  |
| NDI    | not developed in-house   |
| NEI    | Nuclear Energy Institute   |
| NEPA   | National Environmental Policy Act of 1969  |
| NeTi   | Nevada Testing Institute   |
| NFE    | near-field environment   |
| NIPC   | National Infrastructure Protection Center  |
| NMSS   | Office of Nuclear Materials Safety and Safeguards                                  |
| NPS    | National Park Service  |
| NRC    | Nuclear Regulatory Commission  |
| NRS    | Nevada Revised Statute   |
| NTS    | Nevada Test Site   |
| NUREG  | Nuclear Regulatory Commission regulation   |
| NV     | Nevada Operations Office   |
| NWF    | Nuclear Waste Fund   |
| NWPA   | Nuclear Waste Policy Act of 1982   |
| NWTRB  | Nuclear Waste Technical Review Board   |
|        |  |
| OCI    | organizational conflict of interest  |
| OCR    | optical character reader   |
| OCRWM  | Office of Civilian Radioactive Waste Management                                    |
| ODC    | other direct costs   |
| OIT    | Office of Information Technology   |
| OLRC   | Office of Licensing and Regulatory Compliance                                      |
| OMB    | Office of Management and Budget  |
| OPE    | Office of Project Execution  |
| OPPD   | Office of Civilian Radioactive Waste Management Program Procedures Database        |
| OPRRS  | Office of Civilian Radioactive Waste Management Program Records Retention Schedule |
| ORPS   | Occurrence Reporting Processing System   |
| OSCR   | Occupational Safety Compliance Report  |
| OSHA   | Occupational Safety and Health Administration                                      |
|        |  |
| PA     | performance assessment   |
| PAA    | project accumulation area  |
| PACS   | Planning and Control System  |
| PAPR   | performance assessment peer review   |
| PC     | personal computer  |

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|       |  |
|-------|--|
| PC    | performance confirmation                                     |
| PDD   | Project Description Document                                 |
| PDF   | portable document format                                     |
| PDS   | Plant Design System  |
| PETT  | payments-equal-to-taxes                                      |
| pH    | hydrogen ion concentration potential                         |
| P&ID  | pipng and instrument diagrams                                |
| PL    | Public Law   |
| PLO   | Public Land Order  |
| PM&I  | Program Management and Integration                           |
| PMR   | Process Model Report   |
| PORB  | Project Operations Review Board                              |
| PPE   | personal protective equipment                                |
| PR    | Progress Report  |
| PSIR  | Program Status and Issues Review                             |
| PSS   | project summary schedule                                     |
| PST   | Pacific standard time  |
| PVAR  | process validation and reengineering                         |
| PWR   | pressurized water reactor                                    |
|       |  |
| Q     | quality  |
| QA    | quality assurance  |
| QAMA  | Quality Assurance Management Assessment                      |
| QAP   | Quality Assurance Procedure                                  |
| QARD  | Quality Assurance Requirements and Description, DOE/RW-0333P |
| QATSS | Quality Assurance Technical Services Support                 |
| QL    | quality level  |
|       |  |
| RC    | Regulatory Compliance  |
| RCA   | radiological controlled area                                 |
| RCRA  | Resource Conservation and Recovery Act of 1976               |
| RD    | Requirements Document  |
| RDD   | Reference Design Document                                    |
| RDMS  | Records Data Management System                               |
| REKA  | Rapid Evaluation of K and Alpha (thermal probe method)       |
| RFA   | regulatory flexibility analysis                              |
| RIB   | Reference Information Base                                   |
| RIS   | Records Information System                                   |
| R&L   | Regulatory and Licensing Group                               |
| RME   | reasonably maximally exposed                                 |
| ROW   | right-of-way   |
| ROWR  | Right-of-Way Reservation Agreement                           |
| RPC   | Records Processing Center                                    |
| RPP   | Radiological Protection Program                              |
| RRSD  | Repository Reference System Description                      |
| RSIS  | RS Information Systems                                       |
| RSS   | Repository Safety Strategy                                   |
| RTN   | Requirements Traceability Network                            |
|       |  |
| SAA   | satellite accumulation area                                  |
| SAR   | Safety Analysis Report                                       |

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|          |  |
|----------|--|
| SDD      | System Description Document                                      |
| SEPDB    | Site and Engineering Properties Database                         |
| SER      | Safety Evaluation Report   |
| SL       | Seismological Laboratory   |
| SME      | subject-matter expert  |
| SMF      | Sample Management Facility                                       |
| SNF      | spent nuclear fuel   |
| SPT      | Special Project Team   |
| SR       | Site Recommendation  |
| SRCR     | Site Recommendation Consideration Report                         |
| SRD      | Software Requirements Document                                   |
| S/RID    | Standards/Requirements Identification Document                   |
| SSC      | structure, system, or component                                  |
| SSMP     | Strategic System Management Policy                               |
| STR      | Seismic Topical Report   |
| SZ       | saturated zone   |
|          |  |
| T&E      | test and evaluation  |
| TBD      | to be determined   |
| TBV      | to be verified   |
| TBX      | to be determined/to be verified                                  |
| TCO      | Test Coordination Office   |
| TDIF     | Technical Data Information Form                                  |
| TDMS     | Technical Data Management System                                 |
| TER      | Title III Engineering Report                                     |
| TGD      | Technical Guidance Document                                      |
| TH       | thermal-hydrological   |
| THC      | thermal-hydrological-chemical                                    |
| THM      | thermal-hydrological mechanical                                  |
| THMC     | thermal-hydrological-mechanical-chemical                         |
| TIC      | Technical Information Center                                     |
| TIMS     | Technical Information Management System                          |
| TM       | Technical Monitor  |
| TOC      | table of contents  |
| TRIGA    | Training Research Isotopes General Atomics                       |
| TSLCC    | total system life cycle cost                                     |
| TSLCC-SR | Total System Life Cycle Cost for the Site Recommendation         |
| TSPA     | Total System Performance Assessment                              |
| TSPA-LA  | Total System Performance Assessment for the License Application  |
| TSPA-SR  | Total System Performance Assessment for the Site Recommendation  |
| TSPA-VA  | Total System Performance Assessment for the Viability Assessment |
|          |  |
| UCCSN    | University and Community College System of Nevada                |
| UCF      | uncanistered fuel  |
| UIC      | underground injection control                                    |
| UNLV     | University of Nevada at Las Vegas                                |
| UNR      | University of Nevada at Reno                                     |
| USAF     | United States Air Force  |
| USC      | United States Code   |
| USGS     | United States Geological Survey                                  |
| USNC/RM  | U. S. National Committee for Rock Mechanics                      |

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|       |   |
|-------|---|
| UZ    | unsaturated zone  |
| VA    | Viability Assessment  |
| VAR   | Variance Analysis Report  |
| VPP   | Voluntary Protection Program  |
| VRML  | virtual reality markup language                                       |
| WAN   | wide-area network   |
| WBS   | work breakdown structure  |
| WHB   | Waste Handling Building   |
| WP    | waste package   |
| WPO   | Waste Package Operations  |
| WSI   | Wackenhut Services, Inc.  |
| YAP   | Yucca Mountain Site Characterization Project Administrative Procedure |
| YMP   | Yucca Mountain Site Characterization Project                          |
| YMRP  | Yucca Mountain Review Plan  |
| YMSCO | Yucca Mountain Site Characterization Office                           |
| YMSD  | Yucca Mountain Site Description                                       |

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# MONITORED GEOLOGIC REPOSITORY (MGR) PRODUCT GUIDANCE DOCUMENT

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# MONITORED GEOLOGIC REPOSITORY PRODUCT GUIDANCE DOCUMENT

## 1.0 INTRODUCTION

The process of designing, procuring, and constructing a Monitored Geologic Repository (MGR) at Yucca Mountain for the disposal of high-level radioactive waste (HLRW) will receive increased emphasis after submittal of the License Application (LA) and land withdrawal. These activities support the process for site approval and construction authorization as defined in the Nuclear Waste Policy Act of 1982 (NWPA), as amended, Section 114.

The MGR product addresses the activities and actions necessary to engineer, procure, and construct an MGR. After receipt of a Construction Authorization (CA) from the Nuclear Regulatory Commission (NRC), the MGR product also includes activities for the regulatory, infrastructure, and management services (RIMS), performance confirmation (PC), and potential research and development (R&D) testing required to confirm the adequacy of the design.

This planning guidance document describes the MGR product and supporting subproducts in a product-oriented asset structure. Long-term objectives are provided for each subproduct and specific scopes of work are described as necessary, within the current planning period of January 2003 through September 2004, to achieve these objectives. The overall long-term objectives in this product guidance document are consistent with the start of construction in February 2006, substantially complete construction in about September 2008, and receipt of waste in 2010.

## 1.1 MGR Product Definition

The MGR product is comprised of all work after License Application submittal, required to engineer, procure, construct, and operate (EPCO) an MGR to isolate commercial spent nuclear fuel, DOE spent nuclear fuel, and other high-level nuclear waste from the accessible environment. It also includes after receipt of a CA from the NRC, all RIMS, PC, and R&D activities.

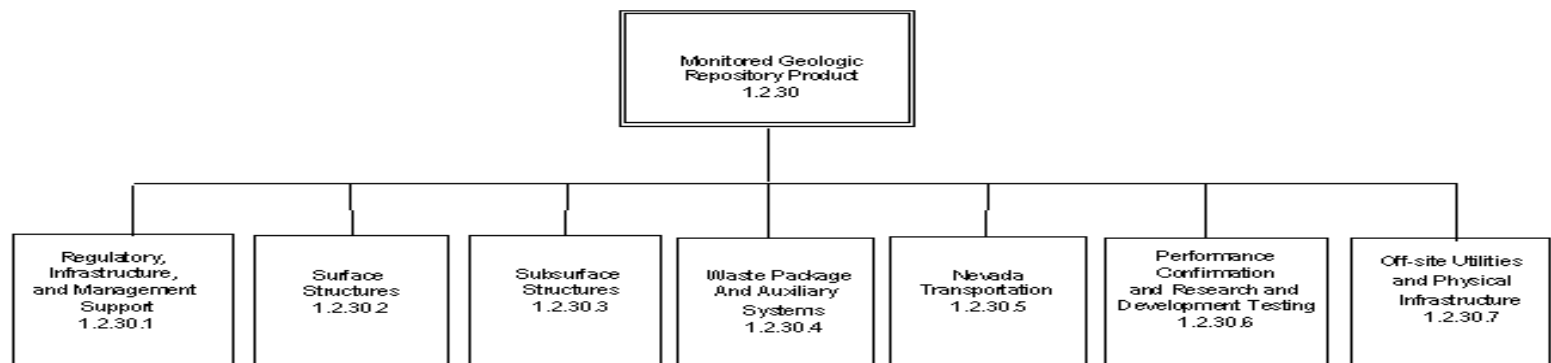
The MGR product is made up of seven subproducts that are comprised of discrete assets segregated by typical professional and industry disciplines. The subproducts include:

- Regulatory, Infrastructure, and Management Support
- Surface Structures
- Subsurface Structures
- Waste Package and Auxiliary Systems
- Nevada Transportation
- Performance Confirmation and Research and Development Testing
- Off-Site Utilities and Physical Infrastructure

A graphical representation of the MGR product work breakdown structure (WBS), which shows the hierarchy of the MGR product and its subproducts, is presented in Figure 1.

## 1.2 General Approach

The following section describes the general approach or strategy for acquiring the MGR product. Specific approaches to executing technical work scope are identified in the subproduct guidance.



**Figure 1. Monitored Geologic Repository Product Work Breakdown Structure**

Effective 10/1/00

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## **Regulatory, Infrastructure, and Management Support (RIMS)**

### ***General Approach***

The general approach for the RIMS subproduct is to provide only the minimum regulatory, integrated systems, environmental, safety and health (ES&H), information management, safeguards and security, quality control, project control, training, institutional affairs, and administrative support services necessary to EPCO the MGR.

All of the RIMS work will continue in the MGR Product as constituted and performed in the LA Product prior to CA.

## **Surface Structures**

### ***General Approach***

The general approach for the Surface Structures is to provide only the minimum services necessary to EPCO the assets and utilities in the Radiological Control and support areas. This subproduct also includes all site roads, common site utilities and sewage, parking areas, and temporary construction support items.

### ***Engineer***

Design descriptions provided in the LA will be further refined and reflected in design packages (drawings and specifications) developed for the repository surface structures in preparation for capital asset acquisition. Designs for capital assets will be developed in the form of Title II design packages that will be used to develop Requests for Proposals (RFPs) and support other acquisition activities. Title II design packages will be based repository surface facilities related system design descriptions (SDDs) and on NRC input from the LA review.

Prototype cask handling, waste handling, and waste packaging equipment will be developed and tested as needed. This work is expected to include design, prototype fabrication, testing, test documentation, and Title II design.

### ***Procure***

Procurement of surface assets shall be accomplished with innovative contracting scenarios to acquire the necessary assets in the most cost-effective manner possible and within established scope, schedule, and quality constraints. The sequencing or timing of design packages and specifications necessary to facilitate procurement and construction of assets shall be based on an analysis of a Critical Path Method (CPM) schedule(s) and Program Evaluation and Review Technique with Cost Factors (PERTCO) chart(s) to assure that adequate assets are operational by 2010 for receipt of waste. Some Title II Design packages will be required shortly after land withdrawal in order to provide an adequate acquisition period to facilitate start of construction of critical path assets in February 2006.

### ***Construct***

The asset construction sequence shall be developed in a manner that minimizes the duplication of assets and services. Assets that support both construction and final operations, such as the integrated fire, medical, and emergency response facility, shall be constructed and staffed early in the program. Planning should be consistent with the objective of initiating site construction work for permanent repository structures in February 2006.

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## **Subsurface Structures**

### ***General Approach***

The general approach for the Subsurface Structures is to provide only the minimum services necessary to EPCO the repository and subsurface construction support assets.

### ***Engineer***

Design descriptions provided in the LA will be further refined and reflected in design packages (drawings and specifications) developed for the repository subsurface structures in preparation for capital asset acquisition. Designs for capital assets will be developed in the form of Title II design packages that will be used to develop RFPs and support other acquisition activities. Title II design packages will be based on repository subsurface facilities related SDDs and on NRC input from the LA review.

Prototype waste package transport and emplacement equipment will be developed and tested as needed. This work is expected to include design, fabrication, testing, test documentation, and development of a Title II Design package.

### ***Procure***

Procurement of subsurface assets shall be accomplished with innovative contracting scenarios to acquire the necessary assets in the most cost-effective manner possible and within established scope, schedule, and quality constraints. The sequencing or timing of design packages and specifications necessary to facilitate procurement and construction of assets shall be based on an analysis of a CPM schedule(s) and PERTCO chart(s) to assure that adequate assets are operational by 2010 for receipt of waste. Some Title II Design packages will be required shortly after land withdrawal in order to provide an adequate acquisition period to facilitate start of construction of critical path assets in February 2006.

Planning should consider buying completed assets or structures as opposed to providing government-furnished equipment for excavating the repository mains and drifts. Planning should consider competitive contracting strategies, and be consistent with having the construction contractor and equipment on site about the end of January 2006.

### ***Construct***

The asset construction sequence shall be developed in a manner that minimizes the duplication of assets and services. Planning should be consistent with the objective of initiating site construction work for permanent repository structures in February 2006.

On-site utility structures and construction support systems that are necessary for repository subsurface construction will be designed, procured and constructed early in the program. This would include removal of all temporary utilities and the installation of permanent or construction support utilities throughout the Exploratory Studies Facility (ESF). This is likely to include the installation of construction ground support in the ESF prior to installing permanent or construction support utilities. Underground utilities include material handling, ventilation, power distribution, lighting, potable water, waste water, compressed air, environmental monitoring, and communications. Planning should be consistent with having support structures and utilities in place and functional by December 2005 to support Construction Authorization and construction initiation in February 2006.

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## **Waste Package and Auxiliary Systems**

### ***General Approach***

The general approach for Waste Package and Auxiliary Systems is to provide only the minimum services necessary to engineer, procure, and install/emplace the waste packages and supports and to conduct prototype development and testing.

### ***Engineer***

Waste Package design descriptions provided in the License Application will be further refined and reflected in design packages (drawings and specifications) developed for capital asset acquisition. Designs for waste packages and supports will be developed in the form of Title II design packages that will be used to develop RFPs and support other acquisition activities. Title II design packages will be based on waste package related SDDs and NRC input from the LA review.

Prototype waste package and auxiliary equipment prototypes will be developed and tested as needed. This work is expected to include design, fabrication, testing, test documentation, and Title II Design packages for each type of waste package.

### ***Procure***

Planning should be consistent with having the initial waste packages on site by 2010 for loading of waste. Acquisition of waste packages should consider competitive contracting strategies and be consistent with the waste forms and their associated arrival schedules.

## **Nevada Transportation**

### ***General Approach***

The general approach for Nevada Transportation is to provide only the minimum services necessary to EPCO the Nevada Transportation system. The Nevada Transportation comprises all rail and highway transportation physical structures and systems required to accommodate transport of spent nuclear fuel and high-level waste within Nevada to the border of the Nevada Test Site or the land withdrawal area.

### ***Engineer***

The design, will include all rail and highway transportation systems required within Nevada to provide waste cask transport to the MGR, including the inter-modal transfer station(s) to facilitate transfer of transportation casks from rail to highway transport vehicles.

### ***Construct & Operate***

An existing commercial operator is preferred for construction, operations, and maintenance of a rail line. Planning should be consistent with the types of planned waste transportation casks, their transport vehicles, and their associated arrival schedules. Planning should also be consistent with delivery of the initial waste to the site by 2010.

## **Performance Confirmation and R&D Testing**

### ***General Approach***

The general approach for PC and R&D Testing is to conduct only the minimum tests necessary to support the performance confirmation and R&D testing needs of the project. The PC and R&D testing, monitoring, and analyses should be sufficient for collecting information necessary to comply with regulatory requirements for confirmation of the design and repository performance as predicted by the Total System Performance Assessment (TSPA)-LA. Technical analyses and reports will be generated to document the findings. Testing efforts will continue as constituted and conducted in the LA Product prior

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to CA. This subproduct will also include all ESF construction and operations needed to support PC and R&D testing.

## **Off-Site Utilities and Physical Infrastructure**

### ***General Approach***

The general approach for Off-Site Utilities and Physical Infrastructure is to negotiate power needs with a commercial vendor. The negotiation will include upgrading the power lines to the boundary of the NTS, the DOE/NV contractor upgrading and maintaining the line from the boundary of NTS to the Canyon Substation, and the project upgrading and maintaining the lines within the withdrawn area. Planning should be consistent with the objective of having off-site power and necessary communications systems in place and functional by December 2005 to support Construction Authorization and construction initiation in February 2006.

## **2.0 REQUIREMENTS AND COMMITMENTS**

The following sections describe the overall statutory and regulatory requirements that are the basis for and govern the work conducted under the MGR product. This section also describes the major DOE policy direction and commitments that must be considered in planning and executing work for the MGR product.

### **2.1 Statutory Requirements**

The process of seeking a CA from the NRC and subsequent construction of a geologic repository at Yucca Mountain for the disposal of HLRW will begin after the License Application is submitted to the NRC in accordance with NWPA Section 114. The NRC will revise the regulations that are the basis for Construction Authorization to be consistent with the public health and safety standards for a geologic repository when these standards are promulgated by the Environmental Protection Agency (EPA).

Section 114(f) of the NWPA requires that any EIS prepared in connection with a repository proposed to be constructed by the Secretary of Energy shall, to the extent practicable, be adopted by the NRC in connection with the issuance of a CA and license for the repository. The National Environmental Policy Act of 1969 (NEPA), 42 U.S. Code (USC) 4321, establishes the requirements for developing the EIS.

Additional statutory requirements applicable to specific MGR subproducts are identified in the subproduct guidance.

### **2.2 Regulatory Requirements**

The requirements established by the NRC under 10 Code of Federal Regulations (CFR) Part 63 (proposed) for disposal of HLRW in a Yucca Mountain repository must be satisfied to provide the information needed for the NRC to make the required findings and authorize construction. Part 63 incorporates other relevant NRC regulations by reference, and these requirements also must be satisfied.

The NRC must modify 10 CFR Part 63, as necessary, to conform the rule to the EPA standards at 40 CFR Part 197, when promulgated. Until 40 CFR Part 197 is proposed, refer to 10 CFR Part 63 for the applicable radiological protection standards.

The requirements for the NRC review of the LA, issuance of a CA, and issuance of a license to receive and possess waste are established at 10 CFR Parts 2 and 63.

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Other general regulatory requirements applicable to the MGR product are contained in the following documents:

- 49 CFR Part 1-99, Federal Highway Administration regulations
- 49 CFR Part 200-265, Federal Railroad Administration regulations
- 41 CFR Part 109, DOE Property Management Regulations.
- 41 CFR Part 101, Federal Property Management Regulations.
- 40 CFR Part 1500, Council on Environmental Quality (CEQ), NEPA Regulation.
- 29 CFR Part 1926, Occupational Safety and Health Standards for the Construction Industry.
- 29 CFR Part 1910, Occupational Safety and Health Standards.
- 10 CFR Part 63, Subpart F, Performance Confirmation Program

Where potential conflicts may exist between NRC or other regulatory requirements and DOE directives, support will be provided to DOE to mitigate these conflicts or to exempt the YMP from these directives.

Additional regulatory requirements applicable to specific MGR subproducts are identified in the subproduct guidance. These regulations include requirements for QA, document and records management, facilities and construction operations, and environmental compliance and radiological programs.

### **2.3 Department of Energy Requirements**

DOE's requirements to the MGR product and supporting work activities are described in List B of the contract, annual S/RIDS requirements analysis, and the following documents:

- DOE Policy 450.4, Safety Management System Policy.
- DOE Policy 411.1, Safety Management Functions, Responsibilities, and Authorities Policy.
- DOE Order 430.1A, Life Cycle Asset Management
- DOE Order 232.1A, Occurrence Reporting and Processing of Operations Information
- DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees
- DOE Order 5480.19, Conduct of Operations for DOE Facilities

DOE's formal requirements and commitments with regard to specific MGR subproducts are described in the subproduct guidance, as applicable.

A Condition Identification Reporting Resolution System (CIRS) database to identify and track the status of commitments and issues through closure was developed and partially populated in 1999. This database will be monitored and updated, as necessary, to ensure identification and disposition of all CA commitments and issues within the appropriate time frame.

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## **2.4 Other Requirements and Directives**

All activities undertaken in the MGR product area will be performed in accordance with applicable DOE directives, program and project procedures, requirement documents, and applicable national consensus standards.

Where potential conflicts may exist between the DOE directives and NRC or other regulatory requirements, support will be provided to DOE to mitigate these conflicts or to exempt the YMP from these directives.

General requirements and directives applicable to the MGR product are contained in the following documents:

- Office of Management and Budget (OMB) Circular A-11, Preparation and Submission of Budget Estimates.
- OMB Circular A-130, Management of Federal Information Resources.
- OMB Circular A-109, Major Systems Acquisition.

All work will be performed and completed in accordance with the following direction on the use of performance confirmation data and analyses, evaluation of records, and development of documents:

- Controlled Use of Scientific and Engineering Data and Models in Support of the YMP LA, J. R. Dyer to L. D. Foust, December 5, 1997.
- Evaluation of Records for Use as References in Project Documents, J. R. Dyer to L. D. Foust, January 12, 1998.
- Policy on Development of Documents That Will be Available to the Licensing Proceeding, J. R. Dyer to R. L. Strickler, R. W. Craig, and D. Walker, March 31, 1998.

All work will be performed and completed in accordance with the QA Requirements and Description (QARD, DOE/RW-333P) and approved procedures.

Other requirements and directives applicable to specific MGR subproducts are identified in the subproduct guidance.

## **3.0 NECESSITY AND ADEQUACY OF PLANNED WORK**

The essence of DOE's strategy for completing the MGR product is to ensure that all planned work is both necessary and adequate to fulfill the defined requirements and commitments. Securing the CA within the announced schedule and available funding requires work to be completed under strict adherence to the YMP procedure and requirement documents.

### **3.1 General Objectives**

The general objectives for ensuring that all work in the MGR product area is both necessary and adequate include the following:

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## ***RIMS***

- Complete adequate design information and documentation to support preparation of the LA update after issuance of the CA.
- Complete a traceable, transparent, and defensible TSPA that supports the LA update.
- To support LA review and update, provide maintenance of a traceable, transparent, and defensible integrated safety analysis for the MGR design, planning and implementation of an integrated systems test and evaluation program, and maintenance of systems interface control documents.
- Provide core ES&H services necessary to comply with state of Nevada permit and statutory requirements and resolution of emerging safety and health issues.
- Provide administrative, business, and management systems that accurately and defensively support overall program operations; provide valid project information; and demonstrate adequate procurement/purchase system stewardship for project resources in a cost-effective and efficient manner. In addition, provide necessary resources to ensure a compliant property management system, which identifies government-furnished and contractor-held property owned by the Nuclear Waste Fund (NWF). This system must provide for the excessing of unneeded property and cleanup of the field sites.
- Provide a safeguards and security program commensurate with NRC requirements to support the safeguarding and security of personnel, facilities, and information.
- Provide a compliant information technology program that meets statutory and regulatory requirements and a cost-effective system for managing project information and data. Also, provide the necessary resources and support to transmit the data requested in the requests for disclosure and in the court orders resulting from the utility lawsuits.
- Provide an integrated project training program that complies with the requirements established in the QARD and a crosscutting project training budgeting and expenditure capture system.
- Provide an institutional information and outreach program that informs the public about project issues and provides an avenue for interface with state, local, and tribal governments and other interested parties. In addition, provide the necessary resources and support to effectively manage the Payments-Equal-to-Taxes (PETT) program.
- Provide a performance status and control system that accurately and completely measures and reports the status of project work performance in a timely manner.
- Provide an Integrated Safety Management System that instills behaviors in all project personnel that promote the safety and well-being of the project worker, the public, and the environment.
- Provide project control and accounting services necessary to meet statutory and DOE requirements for requesting and managing budgets and the project baseline scope, cost, and schedule.

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### ***Surface Structures***

- Complete the Title II design packages in accordance with SDDs that incorporate comments from the NRC review, statutory requirements, and national consensus standards.
- Complete all other technical work identified and described in the subproduct work scopes.
- Maintain a facility management infrastructure necessary to complete all work needed for the construction phase. Provide only the basic infrastructure, equipment, and services to support site facilities management services, and consolidate facilities and functions to the maximum extent feasible.

### ***Subsurface Structures***

- Complete the Title II design packages in accordance with SDDs that incorporate comments from the NRC review, statutory requirements, and national consensus standards.
- Complete all other technical work identified and described in the subproduct work scopes.
- Maintain a facility management infrastructure necessary to complete all work needed for the construction phase. Provide only the basic infrastructure, equipment, and services to support site facilities management services, and consolidate facilities and functions to the maximum extent feasible.

### ***Waste Package and Supports***

- Complete the Title II design packages in accordance with SDDs that incorporate comments from the NRC review, statutory requirements, and national consensus standards.
- Complete all other technical work identified and described in the subproduct work scopes.

### ***Nevada Transportation***

- Complete the Title II design packages in accordance with SDDs that incorporate comments from the NRC review, statutory requirements, and national consensus standards.
- Complete all other technical work identified and described in the subproduct work scopes.

### ***Performance Confirmation and R&D Testing***

- Implement a Performance Confirmation Plan that describes the minimum program necessary to meet regulatory and LA update requirements. Perform only those tests that support regulatory and statutory requirements in accordance with the prospective methods and criteria for evaluating the adequacy and priority of planned work described in Section 3.3 of this guidance document.
- Implement a Research and Development Testing Plan that constitutes the minimum program to confirm the adequacy of the design relative to any safety questions about the engineered and natural barriers important to waste isolation.

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- Maintain site construction services infrastructure necessary to complete all performance confirmation and R&D testing related work in the post-CA phase. Provide only the basic infrastructure, equipment, and services necessary to meet performance confirmation and R&D testing construction and operations requirements, and consolidate functions to the maximum extent feasible.

### ***Off-Site Utilities and Physical Infrastructure***

- Complete all other technical work identified and described in the subproduct work scopes.
- Maintain a facility management infrastructure necessary to complete all work needed for the construction phase. Provide only the basic infrastructure, equipment, and services to support off-site utilities management services, and consolidate functions to the maximum extent feasible.

Every effort should be made to provide only those basic services, tests, and design products necessary to support design, procurement, and construction of an MGR; after Construction Authorization, in addition to this work, execute the performance confirmation and R&D testing, and all the regulatory, infrastructure and management services necessary to support the LA update. This includes, after construction authorization, providing only basic infrastructure, equipment, and construction and operation services to support the performance confirmation testing, R&D testing, and required laboratory operations and site operations.

## **3.2 Necessity of Planned Work**

To be deemed necessary, work must directly address a requirement or commitment related to the NRC's review of the LA; update of the LA and EIS; development of completed Title II design packages (drawings and specifications); execution of a minimum performance confirmation and R&D testing program; or providing basic administrative, business, and management systems necessary to support program and project operations and objectives.

There needs to be a continued effort to conserve resources by providing only the basic infrastructure and services to support design and testing in the most efficient and economical manner possible.

Specific requirements are described in more detail in the subproduct guidance.

## **3.3 Adequacy of Work Planned**

Work is deemed to be adequate if it meets statutory and regulatory requirements, DOE commitments, and DOE requirements and directives. The planned work must address not only the adequacy of the scientific and engineering information, but also the adequacy of the programmatic infrastructure and support activities.

Prospective methods and criteria for evaluating the adequacy and priority of planned work include the following (in priority order):

- *Statutory and Regulatory Compliance*—Available information supports compliance determinations with applicable statutory and regulatory requirements.
- *Commitment Completion*—The terms of any formal DOE commitment have been met or otherwise addressed and the disposition documented, including implementation of an Integrated Safety Management System.

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- *Codes and Standards*—Technical documentation has been (or can be) developed to demonstrate conformance with applicable codes and standards.
  - *TSPA*—Results of TSPA modeling and sensitivity studies show that features, events, and processes important to the safe isolation of radionuclides have been characterized adequately or that they do not have significant effects on total system performance.
  - *Integrated Safety Analysis*—Design packages and analyses support reasonable conclusions with regard to preclosure safety. Designs are adequate to support acquisition of the capital assets.
  - *Confidence/Uncertainty*—Desired levels of confidence or uncertainty have been reached in accordance with performance allocation goals and the repository safety strategy, or additional information is unlikely to significantly reduce uncertainties and these uncertainties either do not change the conclusions or can be mitigated.
  - *Cost and Schedule Efficiencies*—Planned work realizes reasonable and prudent savings in costs or schedules toward completion of CA-related work. Designs are adequate to support acquisition of the capital assets and are provided within a schedule that supports acquisition, construction, and commissioning by the desired milestone dates for waste receipt and emplacement.

## **4.0 MONITORED GEOLOGIC REPOSITORY SUBPRODUCTS**

The MGR product comprises seven subproducts — RIMS, surface structures, subsurface structures, waste packages and auxiliary systems, Nevada transportation, performance confirmation and R&D testing, and off-site utilities and physical infrastructure. Descriptions and guidance for each subproduct are provided in this section.

### **4.1 Regulatory Infrastructure, and Management Support (RIMS)**

The primary purpose for the RIMS subproduct is to provide the necessary interactions with the NRC, maintenance of essential project infrastructure, and management, administrative services required to complete design, procurement, construction, and operations of an MGR.

The RIMS subproduct comprises all work necessary, after securing a CA, to provide the necessary regulatory, ES&H, information management, safeguards and security, quality control, project control, training, institutional affairs, and administrative support services functions to complete the design, procurement, construction and operations of an MGR. All of the RIMS work will continue in the MGR as constituted and performed in the LA Product prior to CA. In addition the RIMS includes, after LA submittal, all work on integrated systems to complete the design, procurement, and construction of an MGR.

Because of the size and number of areas addressed in this subproduct and to address differences in statutory, regulatory, and other requirements, this subproduct is divided into ten elements: Regulatory, Integrated Systems, ES&H, Information Management, Safeguards and Security, Quality Control, Project Control, Training, Institutional Affairs, and Administrative Support Services.

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#### **4.1.1 Regulatory**

The Regulatory element comprises all work necessary to support the Nuclear Waste Technical Review Board (NWTRB); to support NRC interactions during construction of an MGR; to support the NRC licensing reviews and proceedings for the LA update; to prepare, review, and distribute the LA update and supporting documents; to prepare, review, and distribute other required documents and reports to the NRC as necessary; and to prepare, review, and distribute supplements, as necessary, to the FEIS and source documents; and to develop the final radiological Emergency Response Plan.

This element is divided into four subelements: NRC Licensing Review and Proceedings, License Application Update, Final Environmental Impact Statement Supplement, and Emergency Response Plan.

##### **4.1.1.1 NRC Licensing Review and Proceedings**

###### **4.1.1.1.1 Subelement Definition**

This NRC Licensing Review and Proceedings subelement comprises all work necessary to support the NWTRB and NRC licensing review and proceedings, including support for meetings, reviews, and comment response for the LA, LA Update and adoption of the final EIS. This includes participation and retrieval of information in support of meetings and reviews and development of responses to comments received during those meetings and reviews.

This subelement also includes coordination with the NRC and providing support in addressing EIS questions and issues raised during the review process. Topical areas addressed by this task include NEPA coordination and compliance, environmental studies and compliance, land access/land use, radiological, terrestrial ecosystems, socioeconomics, and environmental justice.

###### **4.1.1.1.2 Requirements and Commitments**

Sections 114 and 115 of the NWPA establish the process of seeking a CA from the NRC. The LA will be reviewed by the NRC for compliance with the NRC rule for disposal of HLRW in a proposed Yucca Mountain repository, 10 CFR Part 63. After CA, the NRC requires an LA update prior to issuance of a license to receive and possess spent fuel and high-level waste at the repository site.

Services provided under the NRC Licensing Review and Proceedings subelement are not classified as quality-affecting activities and are not subject to the requirements of the QARD. Appropriate management controls will be applied for the internal review of comment responses and other documentation submitted to the NWTRB or NRC under this subelement.

###### **4.1.1.1.3 Necessity and Adequacy**

The NRC review of the draft LA update is necessary under 10 CFR Part 63 for the NRC to authorize construction of the repository. The LA update is required prior to issuance of a license to receive and possess spent fuel and high-level waste.

The adequacy of the planning for this subelement will be determined by the following criteria:

- The planned support level is adequate for technical and process interactions with the NRC leading to a license to receive and possess spent fuel and high-level waste, as well as the NWTRB and other external parties.

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- The work is defined in the baseline PSS.

#### **4.1.1.2 License Application Update**

##### **4.1.1.2.1 Subelement Definition**

The LA Update subelement comprises all work necessary to prepare, review, and revise the LA update. This subelement also includes all work necessary to revise or develop source, design, and TSPA documents that directly support development of the LA update, but are not specifically addressed under other subproducts.

##### **4.1.1.2.2 Requirements and Commitments**

The requirements and commitments specific to this subelement include the development of a LA Update that will satisfy the requirements of the NRC rule for disposal of HLRW in a proposed Yucca Mountain repository, 10 CFR Part 63, and updating the design, site conditions, and TSPA analysis information and documentation.

Preparation and review of the LA update are not classified as quality-affecting activities and are not subject to the requirements of the QARD. Appropriate management controls will be applied for the internal review of the draft LA update and supporting documentation for review of these submittals.

##### **4.1.1.2.3 Necessity and Adequacy**

An LA Update is necessary to support the NRC review and findings required under 10 CFR Part 63 for the NRC to license the receipt and possession of SNF and HLRW and operations of waste disposal.

The adequacy of the planning for this subelement will be determined by the following criteria:

- The LA Update meets the requirements established in 10 CFR Part 63 and is presented in a way that will facilitate NRC review and the required findings.
- A review of the supporting documentation and inputs defined under this subelement shows that they adequately address the NRC requirements related to safeguards and security, performance confirmation program, radiation protection program, and land ownership.
- The planned support level is adequate for technical and process interactions with the NRC and NWTRB, as well as other external parties.
- The work and deliverables support the schedule defined in the baseline PSS for DOE review and acceptance of the LA update for submittal to the NRC.
- Appropriate QA controls on data, software, and models are completed and implemented and are adequate for the NRC licensing review.

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### **4.1.1.3 Final Environmental Impact Statement Supplement**

#### **4.1.1.3.1 Subelement Definition**

The final EIS Supplement subelement comprises all work necessary to prepare and review the supplement to the EIS and source documents not specifically addressed under other subproducts. This subelement also comprises all work necessary to address EIS related to the closure, decommissioning, and restoration of disturbed sites.

#### **4.1.1.3.2 Requirements and Commitments**

The requirements and commitments specific to this subelement include the development of an EIS supplement in accordance with the requirements established in the NEPA (42 USC 4341 et seq.). The NWPA, as amended, requires the NRC to adopt, to the maximum extent practicable, the DOE EIS prepared in support of the SR.

The decision of whether a supplement to the final EIS is required will be based on semiannual analyses and reports to DOE describing changes to the design, TSPA, and scientific or environmental elements of the program that could affect the environmental impacts described in the final EIS or Mitigation Action Plan. Within these reports, analyses will be provided as to whether any of these changes result in increases in the environmental impacts described in the final EIS or affect the mitigation actions implemented in the Mitigation Action Plan.

Preparation and review of the EIS supplement are not classified as quality-affecting activities and are not subject to the requirements of the QARD. Appropriate management controls will be applied for the internal review of the EIS supplement and supporting documentation for review of these submittals.

#### **4.1.1.3.3 Necessity and Adequacy**

A supplement to the final EIS is necessary if changes to the design, TSPA, scientific, or environmental elements of the program affect the environmental impacts described in the final EIS or Mitigation Action Plan. Requirements for an EIS are established under NEPA (42 USC 4341 et seq.).

The adequacy of the planning for this subelement will be determined by the following criteria:

- The supplement to the final EIS meets the requirements established in the NEPA and are presented in a way that will facilitate EPA and NRC review and adoption.
- The planned support level is adequate for technical and process interactions with the NRC and NWTRB, as well as other external parties.
- The work and deliverables are defined in the baseline PSS for DOE review and acceptance of the final EIS supplement.

### **4.1.1.4 Emergency Response Plan**

#### **4.1.1.4.1 Subelement Definition**

The Emergency Response Plan subelement comprises all work necessary to prepare and implement the radiological Emergency Response Plan. In addition, it comprises all work necessary to train and interface with federal and state agencies and affected units of government on the requirements of the Emergency Response Plan.

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#### **4.1.1.4.2 Requirements and Commitments**

The requirements and commitments specific to this subelement include development of an Emergency Response Plan, as defined in the NRC rule for Disposal of HLRW in a Proposed Yucca Mountain Repository, 10 CFR Part 63.

Preparation and review of the Emergency Response Plan are not classified as quality-affecting activities and are not subject to the requirements of the QARD. Appropriate management controls will be applied for the internal review of the Emergency Response Plan and its supporting documentation.

#### **4.1.1.4.3 Necessity and Adequacy**

An Emergency Response Plan is necessary under the NRC rule for disposal of HLRW in a Proposed Yucca Mountain Repository, 10 CFR Part 63.

The adequacy of the planning for this subelement will be determined by the following criteria:

- The Emergency Response Plan description and Plan meets the requirements established in 10 CFR Part 63 and is presented in a way that will facilitate NRC review.
- The planned support level is adequate for technical and process interactions with the NRC and NWTRB, as well as other external parties.

#### **4.1.2 Integrated Systems**

The Integrated Systems element comprises all the work necessary to provide the MGR system integrated engineering and design testing services after LA submittal.

##### **4.1.2.1 Element Definition**

The Integrated Systems comprises all work after submittal of the LA, necessary to refine and maintain an integrated safety analysis for the MGR design, refine and maintain the test and evaluation plan, implement the integrated systems testing and evaluation, as well as refine and maintain the systems interface control documents (ICDs).

##### **4.1.2.2 Requirements and Commitments**

The requirements and commitments specific to this element include performing and updating as necessary, an integrated safety analysis, as defined in the NRC rule for disposal of HLRW in a proposed Yucca Mountain repository, 10 CFR Part 63. Integral to the design development, procurement, and construction of an MGR, as specified in this regulation, design testing to ensure that the design meets the design requirements, as well as interface control documents (ICDs) are needed.

These activities are classified as quality-affecting activities and are therefore subject to the requirements of the QARD.

Appropriate management controls will be applied for the internal review of the activities.

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#### **4.1.2.3 Necessity and Adequacy**

Integrated Systems is necessary to refine and maintain an integrated safety analysis for the MGR design, refine and maintain the test and evaluation plan, implement the integrated systems testing and evaluation, as well as refine and maintain the systems interface control documents.

The adequacy of the planning for this element will be determined by the following criteria:

- The planned support level is adequate for technical and process interactions with the NRC leading to a license to receive and possess spent fuel and high-level waste, as well as the NWTRB and other external parties.
- The work is defined in the baseline PSS.

#### **4.1.3 Environmental, Safety, and Health (ES&H)**

The ES&H element comprises all the work necessary to provide the ES&H core programs.

##### **4.1.3.1 Element Definition**

The ES&H program element includes compliance with federal and state environmental requirements and regulations and applicable DOE Orders, as identified in the Integrated Safety Management System Requirements Identification Document (ISMS/RID) process, through adherence to applicable permits and agreements with the state of Nevada and other outside agencies. It also includes monitoring work areas for potential hazards, development and implementation of environmental programs and worker safety and health programs, and resolution of emerging environment, safety and health issues.

##### **4.1.3.2 Requirements and Commitments**

The primary purpose of this element is to provide management and oversight resources to maintain compliance with federal and state regulations and DOE directives. As such, this element has a large number of requirements and commitments.

Regulatory requirements specific to this element include, but are not limited to, the following documents:

- 40 CFR Part 1500, Council of Environmental Quality
- 10 CFR 1021, NEPA Regulations
- 40 CFR Series, Protection of Environment
- 29 CFR Part 1910, Occupational Safety and Health Standards (Includes radon monitoring requirements)
- 29 CFR Part 1926, Subpart E, Safety and Health Regulations for Construction
- Nevada Revised Statutes (NRS) pertaining to environmental protection
- Nevada Revised Statutes for Employee Safety and Health

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DOE commitments, requirements, and directives specific to this element are included, but not limited to, the following documents:

- DOE O 231.1 and 5400.1, General Environmental Protection Program
- DOE O 1230.2, American Indian Tribal Government Policy Order
- DOE O 451.1A, NEPA Compliance Program Order
- DOE P 450.1, ES&H Policy for DOE Complex
- DOE O 440.1, Worker Protection Management for DOE Federal and Contractor Employees
- DOE O 151.1, Comprehensive Emergency Management Order
- National Fire Protection Association Codes and Standards
- American Conference of Governmental Industrial Hygienist
- Applicable Industry Consensus Standards

Services provided under this element are not classified as quality-affecting activities and are not subject to the requirements of the QARD.

#### **4.1.3.3 Necessity and Adequacy**

The ES&H element is essential to assure compliance with federal and state regulations, DOE directives, and national consensus standards. Work scope is necessary to continue to assure project compliance; to protect project personnel and the environment; avoid interruption or impact to work or construction activities due to noncompliance; and, to continue to protect the project from potential civil and criminal penalties for noncompliance.

The adequacy of the work for this element will be determined by the following:

- The contractor's ability to maintain compliance with applicable environment, safety and health requirements and to protect project personnel and the environment.
- Annual evaluations of the Civilian Radioactive Waste Management System (CRWMS) environment, safety and health program with recommendations for improvement.

#### **4.1.4 Information Management**

The Information Management element comprises all work necessary to provide information management program services. The element is divided into two subelements: Information technology and Program Information management.

##### **4.1.4.1 Element Definition**

This element comprises all work necessary to plan, acquire, implement, operate, and maintain an information management and security system in compliance with all applicable regulations.

##### **4.1.4.1.1 Information Technology**

The Information Technology subelement comprises information and database systems, network and server operations, user support, planning, compliance, and information security. It includes all tasks associated with requirement analysis, systems definition, software and database design, software application development, testing, implementation, and maintenance in the creation of custom software to support program and project objectives. It also covers the project data management, including the data

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dictionary with standardized and normalized data definitions; recoverability and integrity of commercial databases; and systems administration of database management systems on the host computers supporting developer and end-user requirements, including any necessary software or hardware upgrades.

Information technology also comprises all tasks associated with the operation and maintenance of YMP's office automation environment in the CRWMS Las Vegas facilities, including technical support for desktop computing at local and remote locations and shared operation of a help desk.

Maintain an Information Architecture Baseline (IAB) for the YMP. The IAB specifies the capabilities, constraints (including security), and relationships of information systems, both hardware and software.

Provide support to all litigation's filed against the Office of Civilian Radioactive Waste Management (OCRWM) Program. Work will include maintaining computer system backup tapes, as directed by the DOE legal counsel, and collection and maintenance of all computer system backup tapes until further notice or direction from DOE is received.

Provide support for the search and retrieval of records, as requested in any discovery motions, including copying of records in formats specified by the requestor and transmittal and shipping of records to the requesting organization.

#### **4.1.4.1.2 Program Information Management**

The Program Information Management subelement comprises all services related to records management and general support to record sources by operating a centralized records processing facility. It provides graphic services and publications support and photographic services.

Program information management also includes technical publications management by performing functions related to the creation and maintenance of plans, procedures, technical requirement documents, and the QARD.

#### **4.1.4.2 Requirements and Commitments**

The requirements and commitments specific to information management are contained in the following documents:

- Clinger-Cohen Act of 1996.
- DOE O 1360.2B, Unclassified Computer Security Program.
- DOE O 200.1, Information Management Program.
- OMB Circular A-130, Management of Federal Information Resources.
- DOE General Counsel Memorandum (Dated March 1, 1999), Dow Davis to Bob Wells, Discovery and Records Preservation.

A records management program will be operated in accordance with the following requirements:

- 44 USC, Chapters 21,29, 31, and 33.

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- 10 CFR Part 2, Subpart J, Procedure Applicable to Proceedings for the Issuance of Licenses for the Receipt of HLRW at a Geologic Repository.

Many of the services provided under this element are classified as quality-affecting activities and are subject to the requirements of the QARD.

#### **4.1.4.3 Necessity and Adequacy**

The information management work scope is necessary to provide direct response to requirements set forth by the QARD and applicable DOE Orders for records, document management, computer security, and information management acquisition and planning. These requirements address records and reference management, document control, and document development activities that are necessary to support the Program during all phases of operation. Additionally, this work scope provides responses to discovery motions and other litigation activities received by the DOE for processing. The deliverables identified for the work scope are needed to ensure that all activities are compliant with the QARD, applicable DOE Orders, and the Clinger-Cohen Act of 1996 regarding records management activities, litigation support, and acquisition and management of information technology resources. Specific deliverables associated with the Clinger-Cohen Act include the update and maintenance of the IAB and Information Technology Investment Portfolio.

The adequacy of the work for this element will be determined by the following criteria:

- The Information Technology Investment Portfolio will contain information technology initiatives that have been evaluated, prioritized, and approved by the Information Technology Investment Board or its equivalent. Initiatives must address the supported information management strategic goal(s), information technology architecture, business case, and expected outcomes and benefits, as well as a risk analysis.
- Technology Migration Plans must address how the new technology supports the IAB and should identify the activities, schedules, and resources necessary to accomplish the migration.
- Timely and complete response to all requests for records by DOE and/or the court system will be provided.

#### **4.1.5 Safeguards and Security**

Safeguards and Security comprises all work necessary to implement and manage the safeguards and security program.

##### **4.1.5.1 Element Definition**

The Safeguards and Security element includes management and coordination of program management, physical protection systems, information security, personnel security, counterintelligence, and material control and accounting. Additionally, it includes support to the DOE Safeguards and Security Program, including surveys and self-assessments.

This element also includes updating the MGR Safeguards and Security Plans, developing preliminary safeguards and security procedures and guidelines for the MGR construction activities and providing support to DOE in the NRC review of the LA update.

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#### **4.1.5.2 Requirements and Commitments**

The requirements and commitments specific to this element are contained in the following documents:

- 42 USC 2168, Dissemination of Unclassified Information.
- Revised Interim Guidance Pending Issuance of New NRC Regulations for Yucca Mountain.
- DOE O 5670.3, Counterintelligence Program
- DOE M 5632.1C, Manual for Protection and Control of Safeguards and Security Interests.
- DOE O 551.1, Official Foreign Travel.
- DOE N 142.1, Unclassified Foreign Visits and Assignments.
- DOE O 472.1B, Personnel Security Activities.
- DOE O 471.1, Unclassified Controlled Nuclear Information.
- DOE O 471.2A, Information Security Program
- DOE O 470.1, Safeguards and Security Program.
- DOE C 470.1, Contractor Requirements for the Safeguards and Security Program.

Services provided under this element are not classified as quality-affecting activities and are not subject to the requirements of the QARD.

#### **4.1.5.3 Necessity and Adequacy**

Safeguards and security services are necessary to be in compliance with the Revised Interim Guidance Pending Issuance of New NRC Regulations for Yucca Mountain (Interim Licensing Guidance), which stipulates a detailed plan to provide physical protection of HLRW in accordance with 10 CFR Part 73.51. This plan must include the design for physical protection, the licensee's safeguards contingency plan, and security organization personnel training and qualification plan. The plan must list tests, inspections, audits, and other means to be used to demonstrate compliance with such requirements. In addition, the Interim Licensing Guidance stipulates a description of the material control and accounting program in which "DOE shall implement a program of material control and accounting that is the same as that specified in 10 CFR 72.72, 72.74, 72.76, and 72.78". This work scope also is required to be compliant with DOE Orders and NRC regulations.

The adequacy of the work provided by this element will be determined by the following criteria:

- Provide the DOE/YMSCO Security Manager with safeguards and security support, as requested.
- Manage the security program to comply with all applicable regulations and orders.

#### **4.1.6 Quality Control**

The Quality Control element comprises all work necessary to implement and manage the quality control program.

##### **4.1.6.1 Element Definition**

The Quality Control element is defined as "Those quality assurance actions which provide a means to control and measure the characteristics of an item, process, or facility to established requirements."

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#### **4.1.6.2 Requirements and Commitments**

The requirements and commitments specific to this element are contained in the following documents:

- NQA-1
- DOE/RW-0333P, Quality Assurance Requirements and Description (QARD)
- Project specifications and drawings generated by the M&O.

#### **4.1.6.3 Necessity and Adequacy**

The Office of Quality Assurance provides quality control support to M&O Site Services through inspection, examination, testing and monitoring of site construction and construction-related services as required by project specifications and drawings. These functions are not limited to only those activities designated as “Q” but also include “Non Q” activities as directed by the A/E when it is determined that:

- Inspection and/or examination is required to verify conformance of materials, supplies, parts, components, appurtenances, systems, processes, or structures to project requirements; and/or that,
- Testing is required to determine or verify the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental, or operating conditions.

#### **4.1.7 Project Control**

The Project Control element comprises all work necessary to implement and manage the project planning and control program.

##### **4.1.7.1 Element Definition**

The Project Control element comprises all work necessary to provide project planning and control services, including integrated planning, scheduling, and cost engineering.

Integrated planning provides services for coordinating and managing the baseline plan, which defines the YMP scope, schedule, and costs in accordance with DOE guidance. It supports the preparation of change requests to revise project-level cost and scope baselines and provides analyses to support periodic management reviews, director’s program reviews, and other activities requiring integrated planning and analyses. This element is divided into five subelements: Multi-year Yucca Mountain Project Plan, Baseline management, Integrated Project Schedule, Planning and Control Systems, and Other Services.

##### **4.1.7.1.1 Multi-Year Yucca Mountain Project Plan**

This subelement includes the management, integration, and development of annual updates to the Multi-Year YMP Plan in accordance with DOE guidance by providing the following activities:

- Coordinate and integrate inputs from all affected project organizations to produce the multi-year planning documents required to identify the statement of work, milestones, deliverables, basis of estimates, measurement plans, and budget summaries for the execution of the upcoming fiscal year (FY) and the three subsequent FYs.

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- Coordinate the preparation of plans at the control account, work package, and planning package levels for all affected project organizations with sufficient detail for DOE to authorize the work, and oversee controlled changes to the work plan.
  - Provide risk analysis support during the planning, scheduling, and execution of project work tasks.
  - Analyze project planning documents to ensure that required scope and cost estimates are adequately identified, meaningful performance measurements can be conducted during task execution, and the plan is adequately integrated.
  - Ensure integration across product areas and standardization of scheduling and estimating processes, and support the DOE review and approval of the planning documents.
  - Coordinate the evaluation of issues and impacts associated with the proposed plan, and support preparation of a change request to revise the YMP cost, schedule, and technical baselines to incorporate the DOE-approved annual update into the Multi-Year YMP Plan.
  - Provide the USGS annual update to the multi-year plan in accordance with DOE guidance, including statements of work, deliverables, basis of estimates, measurement plans, and budget summaries for the execution of the upcoming FY and the three subsequent FYs. Support the DOE review and final approval of USGS planning documents.

#### **4.1.7.1.2 Baseline Management**

This subelement includes facilitating the development and maintenance of the Multi-Year Integrated Cost and Schedule Baseline and standardizing scheduling and estimating processes to ensure consistent and accurate data within the YMP control databases.

The following activities will be provided:

- Manage and maintain the YMP Performance Measurement Baseline in accordance with YMP Change Control Directives.
- Coordinate the development of the Level 3 change requests to ensure timeliness, quality, and compliance with procedural requirements.
- Prepare necessary change coordination correspondence among all contractors and DOE.

#### **4.1.7.1.3 Integrated Project Schedule**

This subelement includes schedule development, integration, and maintenance of the Integrated Project Schedule (IPS). It also includes reporting schedule costs, latest revised estimate status, and variance analysis reports in a format that meets management and client needs.

The following activities will be provided:

- Develop a Long-Range Plan/IPS to facilitate the status of the PSS and identify logical ties by activity and/or milestones to each appropriate PSS Level 0, Level 1, or Level 2 milestone.

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- Develop and maintain the YMP input into the Total System Life Cycle Cost, and ensure integration across product areas and standardization of scheduling and estimating processes.

#### **4.1.7.1.4 Planning and Control System**

This subelement includes the following activities:

- Develop, operate, and maintain the OCRWM Planning and Control System (PACS), and perform YMP PACS operations necessary to operate and maintain the OCRWM PACS, which integrates all work scope, cost, and schedule, at the Project and Program level.
- Provide cost and schedule analysis, risk analysis, trend analysis, variance analysis, financial reporting, and exception management support. Analyze all formal replanning efforts and proposed change actions scheduled to be implemented during project execution stages. Analyze project cost and schedule performance data for the monthly reporting cycle. Analyze project performance to highlight achieving Level 2 and Level 3 milestones and deliverables and to identify potential problem areas requiring management attention.
- Provide earned value information, including budgeted cost of work scheduled, budgeted cost of work performed, actual cost of work performed, and estimates at completion on a monthly basis in previously defined Cost Performance Report formats.
- Finalize USGS FY99 and out-year deliverable-based detailed schedules for use in the Project PACS. Develop and maintain bases of estimates for all budgets. Internal schedules will be statused on a monthly basis and used to status PACS work packages. Review monthly narrative reports from the technical staff for use in compiling the monthly progress report. Cost reports for internal programs will be prepared by accounting/financial personnel, compiled, and used with the narrative reports to perform initial analyses of cost and schedule variances.

#### **4.1.7.1.5 Other Services**

This subelement includes the following activities:

- Conduct and coordinate the development of presentation materials for various management meetings and special requests, including, but not limited to, the monthly manager's project review.
- Develop and deploy automated and manual techniques for conducting routine performance data exception management analyses. Automated techniques will be installed in all software packages for use by other organizations. Manual techniques will be documented and disseminated to all organizations needing these tools.
- Develop, improve, and maintain associated baseline control processes, procedures, and desk instructions to support work consistency and quality.

#### **4.1.7.2 Requirements and Commitments**

The requirements and commitments specific to this element are contained in the following documents:

- Government Performance and Results Act
- DOE O 534.1, Accounting

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- DOE O 430.1A, Life Cycle Asset Management
  - DOE G 430.1-5, Cost Estimating Guide
  - DOE O 413.1, Management Control Program
  - DOE O 130.1, Budget Formulation
  - OMB Circular No. A-11, Preparation and Submission of Budget Estimates
  - Strategic System Management Policy

Services provided under this element are not classified as quality-affecting activities and are not subject to the requirements of the QARD.

#### **4.1.7.3 Necessity and Adequacy**

Project planning and control functions are required contractually and are prudent management activities for any contractor conducting business with the government (see requirements or commitments section). Project control functions require a Project Management Control System, which includes a controlled integrated baseline that allows managers to monitor cost, schedule, and work scope performance.

The adequacy of the work provided for this element will be determined by review and processing by DOE in accordance with YMP Administrative Procedure (YAP)-30.63.

#### **4.1.8 Training**

The Training element comprises all work necessary to provide training that meets QA, safety and health, and other DOE-mandated program requirements.

##### **4.1.8.1 Element Definition**

The Training element comprises all work necessary to provide training services that meet quality assurance (QA), safety and health, environmental and other DOE-mandated program requirements. The Training element includes work necessary to plan, develop, implement, and evaluate training policies and programs, which will enable management to ensure that employees can perform their assigned work adequately.

This element will provide training support for the federal staff supporting the CRWMS Program, as requested by the Training Officers of OCRWM, DOE, and the USGS element associated with the CRWMS Program.

In addition, compliance training, including all training required by applicable federal and state statutes and regulations, DOE directives, contractual requirements, and commitment documents, will be provided. Such training may include, but is not limited to, mandated ES&H, ethics, prevention of sexual harassment, diversity, and computer security awareness training.

This scope of work includes the following activities:

- Plan and carry out all training functions, including training needs assessments, job and task analyses efforts, training delivery, qualification activities, arrangement for and oversight of vendor-provided training, training evaluation, and records maintenance.
- Standardize the development and delivery of all training that has general application across the Program to meet the requirements of both the contractor and federal elements of the Program.

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- Ensure that the design and development or selection of such training is fully coordinated with and approved by the subject matter experts.
  - Conduct a systematic needs analysis of proposed training, and document the need and justification for such training for DOE approval.
  - Provide management and maintenance of training and qualification/certification records for CRWMS, OCRWM, and DOE personnel.
  - Ensure that regulatory and management requirements are met for collection, review, maintenance, and submittal of training documents.

Only training programs required by law, regulation, or directive; DOE contractual requirements; or commitment documents, or programs that address mission-related objectives, will be provided. Noncompliance training will be provided only when authorized by DOE management. Training course materials (e.g., lesson plans, handouts) from other DOE locations will be utilized when possible, rather than developing site-specific courses. The most cost-effective training available (e.g., existing DOE training, off-the-shelf training) will be used.

An effective training program will be provided using the five fundamental activities recognized by DOE and NRC for a systematic training approach. These activities include identifying and analyzing training needs, designing training based on those needs, developing training, implementing training, and evaluating training.

#### **4.1.8.2 Requirements and Commitments**

In February 1999, the U.S. General Accounting Office (GAO) issued a Report to the Subcommittee on Energy and Water Development, Committee on Appropriations, House of Representatives, Subject: DOE Actions Necessary to Improve DOE's Training Program, GAO/RCED-99-56. That report applied to both contractor and federal training and included a number of recommendations, which DOE is in the process of implementing.

Some training programs provided under this element are classified as quality-affecting activities and are subject to the requirements of the QARD.

#### **4.1.8.3 Necessity and Adequacy**

The YMP training mission is necessary to ensure that personnel are properly trained before performing their assigned work. The training program fully supports the LA Update and the construction and operation of the repository.

The adequacy of the work provided for this element will be determined by the following criteria:

- The Annual Training Plan should reflect the training requirements and objectives, as established through a needs assessment process, and should contain the information outlined below. The Annual Training Plan should include all training required to ensure maintenance of a trained and qualified work force, as evidenced by satisfactory audits and inspections; an accident-free workplace; and similar indicators. It also should include, to the extent possible, training compliance and site-specific

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training, which will be provided to DOE and USGS employees associated with the Program. The Annual Training Plan is expected to address, at a minimum, the following:

- *Organizational Profile*—Provide a discussion of overall contractor organizational staffing status and goals, including an organization chart that shows where the training function is placed in the organization. Also, include a chart that shows the training activity’s organizational structure. A description of the roles and responsibilities, as well as a vision and mission statement, if available, should be included. Discuss any potential reorganization.
  - *Strategic Approach*—Describe the approach used to meet training requirements, and explain how it is linked to organizational strategic planning (e.g., subcontracting, use of subject matter experts as instructors).
  - *Summary of Training Activities*—Include a description of all education and training program components, including the system for documenting training provided to employees of Program participants, as appropriate. This description should include specific citations of the laws, directives, or commitments to which each component is linked.
- Complete and document a comprehensive needs assessment. The needs assessment process encompasses organizational, occupational, and individual training needs and includes both internal and external training. Ensure that occupational needs consider appropriate compliance-mandated requirements. Use the occupational training needs assessment to ensure that education and training provided to the employees support contractor jobs and are in compliance with federal, state, DOE, and NRC laws, regulations, directives, and commitment documents. Document employee needs (individual and occupational), as well as organizational training requirements in a database. Ensure that training requirements are updated periodically when compliance or job requirements change.
  - Ensure that training results in employees who are qualified to perform their jobs. Develop and maintain site-specific training for technical personnel in accordance with applicable procedures.
  - Provide a systematic means for evaluating external training to ensure that training provided by vendors meets the learning objectives. Maintain a matrix of training requirements, including a comprehensive list of required training, basis for applying the requirement to the program, and scope of the training.
  - Maintain a continuous improvement program that performs regular program self-assessments and evaluations. Provide effective training at the least cost possible.
  - Standardize the development and delivery of training, and use courses from other DOE elements and off-the-shelf courses whenever possible.
  - Provide an annual report on external training and tuition reimbursement to DOE. Provide specific training cost information to DOE no later than January 15 of each year for submission to Congress. In addition, include a narrative explanation of all major increases and decreases in training funds from one year to the next in the annual report. The narrative should include:
    - *Cost of Training Organization*—Include all associated costs, including travel. Training organization includes not only the staff assigned to the recognized work unit/organization where the primary purpose is to provide, coordinate, and/or develop the actual training of employees,

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but also other staff not formally assigned to a training work unit who spend at least 50 percent of their time supporting training.

- *Costs Associated With or Contracting Out for Training*—Include tuition/registration fees paid to send employees to training; contracting for contractors to conduct, deliver, develop, or support training; and acquisition or rental of training equipment, materials, supplies, and space, including leased space.
- *Student Costs*—Include costs associated with employee attendance at training, including salaries for time spent both in training and traveling to and from training and the associated travel costs.
- *Total Duty Hours*—Include the total number of on-duty hours associated with attendance at training, including hours in training and traveling to and from training.
- *Total Nonduty Hours*—Include the total number of off-duty hours associated with attendance at training. Do not include travel to and from training.
- *Instances of Training*—Include the total number of training instances in each training area (e.g., classes, briefings, computer-based training, on-the-job training).
- Track the training of all personnel, and notify them when required training is offered. The staff processes all personnel training and qualification records into the records information system and provides scheduling, registration, and logistics support for all training.
- Provide training to project personnel in project orientation, environmental protection, radiological protection, safety and health, QA, industrial hygiene, underground operations, emergency management, and work processes compliance. Project personnel also are trained on conduct of operations.
- Utilize performance-based training techniques to develop training based on the tasks that a person actually performs. This technique, along with the overall systematic approach to training, provides DOE management with a proven mechanism to adjust qualification requirements as task assignments are changed and new equipment is installed.

#### **4.1.9 Institutional Affairs**

The Institutional Affairs element comprises all work necessary to provide institutional and external affairs program services.

##### **4.1.9.1 Element Definition**

The Institutional Affairs element comprises all work necessary to provide institutional and external affairs services, including intergovernmental relations, public outreach, and information product development. This element includes the following programs, which are distinct from one another and provide support services to a variety of organizations and disciplines:

- Stakeholder Response and Interaction
- Media Response and Interaction
- Science Center(s)
- Facility and Field Exhibits

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- Informational Product Development/Management and Operating Contractor Printing
  - Information Response
  - Tour Program
  - Speakers' Bureau
  - Exhibit Program
  - Information Program
  - Meeting Management
  - Web Site and Database Activities
  - PETT

This element is divided into three subelements: Intergovernmental Relations, Public Outreach, and information product development.

#### **4.1.9.1.1 Intergovernmental Relations**

The Intergovernmental Relations subelement comprises the stakeholder program, which includes the conduct of all legislative and intergovernmental activities.

This subelement supports and coordinates all YMP interactions with national, state, local, and tribal government entities; regulatory agencies; public interest groups; the Nevada business community; other stakeholders; and the public.

#### **4.1.9.1.2 Public Outreach**

The Public Outreach subelement promotes public interest in and understanding of issues related to the disposal of SNF and HLRW via tours of Yucca Mountain; exhibits at community and technical conferences and events; a speakers bureau; operation of science center(s); and an information and inquiry response program, including a toll-free information line and YMP Home Page.

#### **4.1.9.1.3 Information Product Development**

The Information Product Development subelement provides services that develop, update, and acquire audiovisuals, publications, models, and commercial print/electronic media announcements in support of the science center(s), and exhibits.

#### **4.1.9.2 Requirements and Commitments**

The requirements and commitments specific to institutional affairs are contained in the following documents:

- DOE P 1210.1, DOE Public Participation Policy.
- DOE O 1220.1A, DOE Congressional and Intergovernmental Affairs Order.
- DOE O 1340.1B, Management of Public Communication Publication and Scientific and Engineering Publication Order.
- DOE O 1350.1, Audiovisual and Exhibit Management Order.

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Services provided under this element are not classified as quality-affecting activities and are not subject to the requirements of the QARD.

#### **4.1.9.3 Necessity and Adequacy**

Institutional interactions are required by the findings section of the NWPA, as amended, which states that “State and public participation in the planning and development of repositories is essential to promote public confidence in the safety of disposal of such waste and spent fuel.” This section, and others regarding financial assistance, consultation and cooperation, provides the foundation upon which the activities and deliverables in the institutional interactions are based.

This work is directed at ensuring that the affected units of government and the public have an opportunity to participate in activities and acquire information that is needed to make informed decisions about the YMP.

#### **4.1.10 Administrative Support Services**

The Administrative Support Services element comprises all work necessary to provide direct-charge administrative support activities that do not duplicate the services provided in PM&I.

##### **4.1.10.1 Element Definition**

The Administrative Support Services element comprises all work necessary to provide general administrative support services such as, procurement and property management resources, personnel, and other business services; facilities, equipment maintenance and mail distribution for DOE; Las Vegas-based motor pool services; facility lease costs; and operational management to support all telecommunications activities. Also, this element includes all work to provide administrative support services to DOE personnel, telecommunications services to all Las Vegas and NTS based participants, televideo support for the Hillshire facility, budget and services relating to lease renewals, and security clearance investigations. The Administrative Support Services element is divided into five elements: Procurement And Property Management Services; Personnel and Other Administrative Services; Facilities Support, Equipment Maintenance and Mail Distribution, U.S. Geological Survey (USGS) Facility Lease, and Las Vegas-Based Motor Pool.

##### **4.1.10.1.1 Procurement and Property Management Services**

This subelement will provide procurement and property management support to include the following tasks:

- Process all procurements and manage subcontracts.
- Maintain a computerized system to track the status of procurements and subcontracts.
- Manage and control capital equipment procurements.
- Manage, control, and dispose of all property procured with the NWF and in accordance with NWF requirements.
- Prepare responses to various ad hoc information requests.

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#### **4.1.10.1.2 Personnel and Other Administrative Services**

This subelement will provide support personnel and other administrative services to include the following:

- Provide administrative, secretarial, and other services, such as editing, printing, incidental graphics, minor publications, photography, and mail distribution.
- Provide legal services, personnel services, and clerical and logistical support to off-site teammates.
- Provide editing and publication distribution services for all technical information products and publications.
- Maintain the action item tracking systems and administrative files.
- Provide support for technical information displays, technical publications, and procedure reviews.
- Provide services for the purchasing, processing, and distribution of office and administrative supplies.
- Provide computer support services for local area network programming and troubleshooting.
- Develop and implement the necessary controls that meet administrative, technical, and quality requirements.
- Monitor and report work package account performance, including input to monthly reports and variance reports.
- Provide services for and participate in other initiatives, including developing responses to ad hoc requests not otherwise described above.

#### **4.1.10.1.3 Facilities Support, Equipment Maintenance, and Mail Distribution**

This subelement will provide facilities, equipment maintenance, and mail distribution support for DOE to include the following:

- Conduct space planning studies for organizations residing in the Hillshire building.
- Support the DOE Hillshire Building Manager with internal moves, construction estimates, electrical requirements, and furniture modifications.
- Provide and maintain copiers located in the Hillshire building.
- Maintain YMP-related Federal Express mailroom expenses.

#### **4.1.10.1.4 U.S. Geological Survey Facility Lease**

This subelement will provide rent, including facility maintenance, for the facility lease costs for the Las Vegas area space used by USGS staff.

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#### **4.1.10.1.5 Las Vegas-Based Motor Pool**

This subelement will provide the Las Vegas-based motor pool services, including managing a fleet of General Services Administration vehicles in Las Vegas for use by YMP personnel and providing shuttle service for transporting project staff within Summerlin and the surrounding area.

#### **4.1.10.2 Requirements and Commitments**

The requirements and commitments specific to this element are contained in the following documents:

- 41 CFR Part 109, Subparts G, H, and I, DOE Property Management Regulations.
- 41 CFR Part 101, Subparts G, H, and I, Federal Property Management Regulations.
- 10 CFR Part 63, Disposal of HLRW in a Proposed Geologic Repository at Yucca Mountain, Nevada.
- Energy Policy Act of 1992.

Services provided under this element are not classified as quality-affecting activities and are not subject to the requirements of the QARD.

#### **4.1.10.3 Necessity and Adequacy**

Administrative activities are necessary to support overall project operations. Federal regulations require a property management system. Vehicle management must be in compliance with the Energy Policy Act of 1992. Good business practices are reflected in the provision of procurement management systems, telecommunications support, and facilities management.

The adequacy of the work provided by this element will be determined by the following criteria:

- Administrative services are provided to meet DOE specifications.
- Administrative services are delivered in a timely manner.

### **4.2 Surface Structures**

The primary purpose of the Surface Structures subproduct is to provide surface structures for receiving SNF and HLW shipments and preparing and packaging the waste for underground emplacement. Balance of plant support structures, such as an administration building and fire station, are also provided. The surface assets discussed in this guidance are based on the Reference Case that utilizes design requirements and criteria established in the LADS EDA-2 and/or Design Options for SR (D. R. Wilkins – January 10, 2000, presentation to senior DOE management) which may or may not reflect the design carried forward to LA. However, the overall strategy for providing these assets should not change.

#### **4.2.1 Subproduct Definition**

The Surface Structures subproduct comprises all work necessary after submittal of the License Application, to design, procure, and construct repository surface structures to receive, handle, and package spent nuclear fuel and high-level waste, and place the waste packages onto repository transport vehicles. This includes the design, procurement, construction, and testing of prototype systems and components, as necessary, to ensure development of integrated, fully functional systems. In addition, it includes the design, procurement, and construction of all necessary on-site, surface utility systems and transportation systems required to support the surface and subsurface functions and missions. The work includes continuation of the development and maintenance of the design basis documentation SDDs

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associated with the surface structures. The subproduct also includes all Yucca Mountain surface facility management support services including all surface facility design and procurement management, construction management and integration, surface operations logistics support, surface facility and system maintenance management, as well as surface prototype test facilities management, operations, and maintenance. Repository surface structures and support systems include the following:

- ***Site Work and Transportation***
  - Site Work
  - On-Site Rail
  - Roads and Parking
  - Flood Control System
- ***Waste-Handling Structures***
  - Waste Handling Building
  - Waste Treatment Building
  - Carrier Preparation Building
  - Transporter Maintenance Building
  - Air Lock Building
- ***Site Support Systems***
  - Sewage Treatment
  - Water
  - Power System
  - Monitoring and Control System
  - Security System
  - Environmental System
  - Communications System
- ***Support Structures***
  - Administration Building
  - Safety and Security Building
  - Utility Building
  - Mock-Up Building
  - Visitor Center
  - Change House
  - Medical Center
  - Fire Station
  - Motor Pool
  - Central Shops
  - Central Warehouse

#### **4.2.2 Requirements and Commitments**

The requirements and commitments specific to this subproduct include development of design packages (drawings and specifications) that describe and are consistent with technical and QA requirements that will satisfy the requirements established in the NRC rules and regulations for Disposal of HLRW in a Proposed Yucca Mountain Repository, 10 CFR Part 63. Preparation, review, issuance, and configuration management of surface structure design packages are classified as quality-affecting activities and are subject to the requirements of the QARD.

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The requirements and commitments specific to this subproduct are contained in the following documents:

- 49 CFR Part 1-99, Federal Highway Administration regulations
- 49 CFR Part 200-265, Federal Railroad Administration regulations
- 29 CFR Part 1926, Occupational Safety and Health Standards for the Construction Industry.
- 29 CFR Part 1910, Occupational Safety and Health Standards.
- DOE Policy 450.4, Safety Management System Policy.
- DOE Policy 411.1, Safety Management Functions, Responsibilities, and Authorities Policy.
- DOE Order 430.1A, Life Cycle Asset Management
- DOE Order 232.1A, Occurrence Reporting and Processing of Operations Information
- DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees
- DOE Order 5480.19, Conduct of Operations for DOE Facilities
- Technical Baseline Requirements
- National Consensus Standards

#### **4.2.3 Necessity and Adequacy**

A description of surface structure design is necessary to support the NRC review and findings required in 10 CFR Part 63 for the NRC to authorize construction of the repository. Complete design packages are necessary to facilitate acquisition and construction of capital assets.

The adequacy of the planning for this subproduct will be determined by the following criteria:

- Design descriptions are adequate for the NRC licensing review and are transitioned to design packages adequate to facilitate acquisition and construction.
- The work and deliverables support the schedule defined in the baseline Project Summary Schedule (PSS).
- Appropriate QA controls on design analyses and software are completed and adequate for the NRC licensing review.
- Structures and equipment are maintained, repaired, and replaced, as necessary, to meet the requirements established in 29 CFR Part 1910 and DOE Order 430.1A.
- The basic infrastructure, equipment, and services to support surface facilities design, procurement and construction are provided in an efficient and economical manner.

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## 4.3 Subsurface Structures

The primary purpose of the Subsurface Structures subproduct is to provide subsurface structures for emplacing and disposing of SNF and HLW. The subsurface assets discussed in this guidance are based on the Reference Case that utilizes design requirements and criteria established in the LADS EDA-2 and/or Design Options for SR (D. R. Wilkins – January 10, 2000, presentation to senior DOE management) which may or may not reflect the design carried forward to LA. However, the overall strategy for providing these assets should not change.

### 4.3.1 Subproduct Definition

This subproduct comprises all work necessary after submittal of the License Application to provide waste package transport vehicles and repository underground structures to transport, emplace, ventilate, and monitor spent nuclear fuel and high-level waste packages in an MGR, to safely isolate the waste from the accessible environment. It includes the design and testing of subsurface prototype waste-handling equipment as necessary to ensure development of integrated, fully functional subsurface MGR systems. In addition, it includes design, procurement, and construction of all necessary underground utility systems and transportation systems required to support the subsurface functions and mission. The work includes continuation of the development and maintenance of the design basis documentation SDDs associated with the subsurface structures. It also provides all Yucca Mountain subsurface management support services, including all underground design and procurement management, construction management and integration, underground operations logistics support, underground facility and system maintenance management, and underground MGR systems prototype test facilities management, operations, and maintenance.

Repository subsurface structures and support systems include the following:

- Access Mains and Drifts
- Emplacement Drifts
- Excavated Material Handling
- Subsurface Support Structures
- Development Ventilation Shaft(s)
- Emplacement Ventilation Shaft(s)
- South Portal Structures
- Prototype Waste-Handling Equipment
- Performance Confirmation Subsurface Structures
- Ground Support/Lining

### 4.3.2 Requirements and Commitments

The requirements and commitments specific to this subproduct include the development of design packages (drawings and specifications) that describe and are consistent with technical and QA requirements that will satisfy the requirements of the NRC rule for disposal of HLRW in a proposed Yucca Mountain repository, 10 CFR Part 63.

Preparation, review, issuance, and configuration management of subsurface structure designs and design packages are classified as quality-affecting activities and are subject to the requirements of the QARD.

The requirements and commitments specific to this element are contained in the following documents:

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- 29 CFR Part 1926, Occupational Safety and Health Standards for the Construction Industry
  - 29 CFR Part 1910, Occupational Safety and Health Standards.
  - DOE Policy 450.4, Safety Management System Policy.
  - DOE Policy 411.1, Safety Management Functions, Responsibilities, and Authorities Policy.
  - DOE Order 430.1A, Life Cycle Asset Management
  - DOE Order 232.1A, Occurrence Reporting and Processing of Operations Information
  - DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees
  - DOE Order 5480.19, Conduct of Operations for DOE Facilities
  - Technical Baseline Requirements
  - National Consensus Standards

### **4.3.3 Necessity and Adequacy**

Descriptions of subsurface structure design and waste package transporter are necessary to support the NRC review and findings required under 10 CFR Part 63 for the NRC to authorize construction of the repository. Complete design packages are necessary to facilitate acquisition and construction of capital assets.

The adequacy of the planning for this subproduct will be determined by the following criteria:

- Design descriptions are adequate for the NRC licensing review and are transitioned to design packages adequate to facilitate acquisition and construction.
- The work and deliverables support the schedule defined in the baseline PSS.
- Appropriate QA controls on design analyses and software are completed and adequate for the NRC licensing review.

## **4.4 Waste Packages and Auxiliary Systems**

The primary purpose of the Waste Packages and Auxiliary Systems subproduct is to provide a portion of the engineered barrier system that contains and protects SNF and HLW during the disposal period.

### **4.4.1 Subproduct Definition**

The Waste package and Auxiliary Systems subproduct comprises all work necessary after submittal of the License Application to design, develop, and fabricate waste packages and auxiliary systems and components to facilitate safe containment and isolation of:

- Commercial spent nuclear fuel
- DOE-owned spent nuclear fuel

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- Defense high-level waste glass canisters
  - Immobilized plutonium waste canisters
  - Navy nuclear fuel canisters

It also includes the design, procurement, fabrication, and testing of prototype waste package systems and components, as necessary, to ensure development of integrated, fully functional MGR waste packages and auxiliary systems. The work includes continuation of the development and maintenance of the design basis documentation SDDs associated with the waste package and auxiliary systems. In addition it will provide all waste package system management support services including waste package design and procurement logistics support, fabrication management and integration, waste package system management, as well as waste package prototype test facilities management, operations, and maintenance.

Waste packages and auxiliary systems include the following:

- Waste packages to accommodate the waste forms identified above
- Waste Package Supports
- Drip Shields

#### **4.4.2 Requirements and Commitments**

The requirements and commitments specific to this subproduct include the development of design packages (drawings and specifications) that describe and are consistent with technical and QA requirements that will satisfy the requirements of the NRC rule for Disposal of HLRW in a Proposed Yucca Mountain Repository, 10 CFR Part 63.

Preparation, review, issuance, and configuration management of waste package designs and design packages are classified as quality-affecting activities and are subject to the requirements of the QARD.

#### **4.4.3 Necessity and Adequacy**

Descriptions of waste package designs are necessary to support the NRC review and findings required in 10 CFR Part 63 for the NRC to authorize construction of the repository. Complete design packages are necessary to facilitate acquisition and construction of these assets.

The adequacy of the planning for this subproduct will be determined by the following criteria:

- Design descriptions are adequate for the NRC licensing review and are transitioned to design packages adequate to facilitate acquisition and fabrication.
- The work and deliverables support the schedule defined in the baseline PSS.
- Appropriate QA controls on design analyses and software are completed and adequate for the NRC licensing review.

#### **4.5 Nevada Transportation**

The primary purpose of the Nevada Transportation subproduct is to provide the physical structures and systems required to accommodate transport of spent nuclear fuel and high-level waste within Nevada to the MGR entrance security station.

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#### **4.5.1 Subproduct Definition**

The Nevada Transportation subproduct comprises all work necessary after submittal of the License Application to provide the physical structures and systems required to accommodate transport of spent nuclear fuel and high-level waste within Nevada to the MGR entrance security station. It includes design, procurement, and construction of all rail and highway transportation systems required within Nevada to provide waste cask transport to the MGR, including the inter-modal transfer station(s) to facilitate transfer of transportation casks from rail to highway transport vehicles. The work also includes continuation of the development and maintenance of the design basis documentation SDDs associated with the Nevada transportation systems. In addition it will provide all Nevada transportation system management support services including transportation system design and procurement logistics support, construction management and integration, transportation system management, as well as transportation prototype test facilities management, operations, and maintenance.

#### **4.5.2 Requirements and Commitments**

The requirements and commitments specific to this subproduct include development of design packages (drawings and specifications) that describe and are consistent with technical and QA requirements that will satisfy the requirements established in the NRC rules and regulations for disposal of HLRW in a Proposed Yucca Mountain Repository, 10 CFR Part 63.

The requirements and commitments specific to this subproduct are contained in the following documents:

- 49 CFR Part 1-99, Federal Highway Administration regulations
- 49 CFR Part 200-265, Federal Railroad Administration regulations
- 29 CFR Part 1926, Occupational Safety and Health Standards for the Construction Industry.
- 29 CFR Part 1910, Occupational Safety and Health Standards.
- DOE Order 430.1A, Life Cycle Asset Management
- DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees
- DOE Order 5480.19, Conduct of Operations for DOE Facilities
- Technical Baseline Requirements
- National Consensus Standards

Preparation, review, issuance, and configuration management of Nevada transportation design packages are classified as quality-affecting activities and are subject to the requirements of the QARD.

#### **4.5.3 Necessity and Adequacy**

A description of Nevada transportation system design is necessary to support the NRC review and findings required under 10 CFR Part 63 for the NRC to authorize construction of the repository. Complete design packages are necessary to facilitate acquisition and construction of capital assets. The adequacy of the planning for this subproduct will be determined by the following criteria:

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- Design descriptions are adequate for the NRC licensing review and are transitioned to design packages adequate to facilitate acquisition and construction.
  - The work and deliverables support the schedule defined in the baseline Project Summary Schedule (PSS).
  - Appropriate QA controls on design analyses and software are completed and adequate for the NRC licensing review.
  - Structures and equipment are maintained, repaired, and replaced, as necessary, to meet the requirements established in 29 CFR Part 1910, 49 CFR Parts 1-99 and 200-265, and DOE Order 430.1A.

The basic infrastructure, equipment, and services to support Nevada transportation are provided in an efficient and economical manner.

## **4.6 PC and R&D Testing**

The PC and R&D Testing subproduct implements the testing programs that are consistent with the latest revisions of the Performance Confirmation Plan and the R&D Testing Plan, as described in the LA.

### **4.6.1 Subproduct Definition**

The PC and R&D Testing subproduct comprises all work necessary after Construction Authorization to refine and maintain as necessary the Performance Confirmation (PC) plan for site and laboratory testing to achieve the objectives of the Performance Confirmation program as required by NRC regulations. It also includes refinement and maintenance as necessary of the Research and Development (R&D) plan to confirm the adequacy of the design relative to any safety questions associated with the engineered and natural barriers important to waste isolation. The subproduct provides technical support for test and test facility design, equipment and instrument procurement, facility construction, test set-up, instrumentation calibration, and conduct of the tests. This includes technical support for test data reduction and analysis, confirmation analyses, and reporting, as well as management, operations, and maintenance of the test facilities. The work also includes continuation of the development and maintenance of the design basis documentation SDDs associated with the performance confirmation program.

The performance confirmation program includes:

- Confirmation that subsurface conditions encountered during construction and waste emplacement operations or changes in those conditions are within the limits assumed and cited in the LA.
- Confirmation that the natural and engineered barriers and their components are functioning as required and predicted.
- Evaluation of compliance of postclosure performance requirements with the NRC.

This subproduct also comprises all work necessary to provide the basic ESF construction and appropriate laboratory support services for performance confirmation testing and R&D testing and technical support for the laboratory and ESF operations and maintenance programs.

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#### **4.6.2 Requirements and Commitments**

A performance confirmation program is required for the MGR product, and a brief description is provided in 10 CFR Part 63, Subpart F (proposed). An R& D testing program is required by paragraph 63.21 (c) (21) (Proposed) of the same regulation.

The requirements and commitments specific to site construction services are established in 29 CFR Part 1926, Occupational Safety and Health Standards for the Construction Industry; DOE Order 430.1A, Life Cycle Asset Management; and DOE Order 5480.19, Conduct of Operations for DOE Facilities.

Performance confirmation and R& D test data collection and analyses are classified as quality-affecting activities and are subject to the requirements of the QARD.

Laboratory and general site construction and associated facilities management are classified as non-quality-affecting activities and are not subject to the requirements of the QARD.

#### **4.6.3 Necessity and Adequacy**

The performance confirmation program and R&D Testing are necessary to support the NRC review and findings required in 10 CFR Part 63 for the NRC to issue a license to receive and possess spent fuel and high-level waste.

The adequacy of the planning for this subproduct will be determined by the following criteria:

- The performance confirmation program is adequate and necessary when testing, monitoring, analyses, and modeling are identified and sufficient for collecting information necessary to comply with regulatory requirements for confirmation of the repository performance, as predicted by the TSPA-LA.
- The R&D testing includes testing, analysis and documentation sufficient to demonstrate resolution of remaining safety questions concerning the engineered and natural barriers.
- The performance confirmation program includes provisions for testing, monitoring, analyzing, and modeling for the natural barrier, engineered barrier, and subsurface development, and it is the minimum scope of work necessary to meet regulatory requirements.
- Construction services and deliverables are provided consistent with performance confirmation testing requirements and the requirements established in 29 CFR Part 1926, Occupational Safety and Health Standards for the Construction Industry; DOE Order 430.1A, Life Cycle Asset Management (Order, Guides, and Appendixes); and DOE Order 5480.19, Conduct of Operations for DOE Facilities.
- Site construction and facilities services are provided consistent with the ES&H requirements established in federal regulations, national consensus standards, and state of Nevada permits.
- Structures and equipment are maintained, repaired, and replaced, as necessary, to meet the requirements established in 29 CFR Part 1926, Occupational Safety and Health Standards for the Construction Industry, and DOE Order 430.1A, Life Cycle Asset Management.

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- The basic infrastructure, equipment, and services to support site and laboratory R&D testing are provided in an efficient and economical manner.

#### **4.7 Offsite Utilities and Physical Infrastructure**

The primary purpose of the Offsite Utilities and Physical Infrastructure subproduct is to provide the utilities and associated infrastructure required from off-site to construct an MGR and to operate the Nevada transportation system.

##### **4.7.1 Subproduct Definition**

The Offsite Utilities and Physical Infrastructures subproduct comprises all work necessary after submittal of the License Application to provide physical structures, systems, and components required to deliver necessary utilities to the MGR and the off-site transportation systems. The subproduct includes the design, procurement, and construction of the off-site delivery structures and systems to provide the needed utilities to the MGR site, as well as the necessary utility systems for the off-site transportation systems and the inter-modal transfer station(s). The necessary utilities include as a minimum:

- Electric power
- Communications

The work also includes continuation of the development and maintenance of the design basis documentation SDDs associated with the off-site utilities systems. In addition it will provide all off-site utilities system management support services including utility system design and procurement logistics support, construction management and integration.

##### **4.7.2 Requirements and Commitments**

The requirements and commitments specific to this subproduct include development of design packages (drawings and specifications) that describe and are consistent with technical and industry standard requirements for utility and physical infrastructure systems.

Preparation, review, issuance, and configuration management of off-site utilities and physical infrastructure system design packages are not classified as quality-affecting activities therefore are not subject to the requirements of the QARD.

##### **4.7.3 Necessity and Adequacy**

Complete design packages are necessary to facilitate acquisition and construction of capital assets.

The adequacy of the planning for this subproduct will be determined by the following criteria:

- Design packages are adequate to facilitate acquisition and construction.
- The work and deliverables support the schedule defined in the baseline Project Summary Schedule (PSS).
- Structures and equipment are maintained, repaired, and replaced, as necessary, to meet the requirements established in 29 CFR Part 1926 and DOE Order 430.1A.

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The basic infrastructure, equipment, and services to support off-site utilities and associated physical infrastructure are provided in an efficient and economical manner.